

The Tertiary Fauna of Markuševec in Croatia. [*Fauna fossile Terziaria* &c.] By S. BRUSINA. Svo. 98 pp. Zagreb (Agram). 1892. [Reprint from the 'Glasnik Hrvatsk. Naravn. Društva,' vii. Godina.]

THIS memoir, published by the Natural-History Society of Croatia, is a continuation of the results of the researches of Spiridion Brusina on the palæontology of Dalmatia, Croatia, and Slavonia, more especially the Tertiary Mollusks (largely of estuarine or brackish character). The Director of the National Museum has devoted much time and energy to this work, some results of which were noticed in the *Ann. & Mag. Nat. Hist.* for June 1875; and other results have been since published in Austria-Hungary.

Some fossils collected by him from a sandstone of the "Congerian Formation" at the "Kelekovo polje," not far from Markuševec, were found to comprise some vertebræ, teeth, and otoliths of fishes, fragments of Polyzoa, numerous valves of Ostracods, tubes of Annelides, spines of Echinoderms, spicules of Sponges, and many Foraminifera. This collection is so important to local and other geologists that a full list is given of its species of *Limax*, *Helix*, and *Succinea* (few), 2 of *Limnaea*, 8 of *Planorbis*, 1 of *Melania*, 17 and more of *Melanopsis*, 2 of *Melanoptychia*, 26 and more of the Hydrobiidæ, 7 of Valvatidæ, of *Orygoceræ* 4, *Cyclostoma* 1, *Neritona* 1, *Neritodonta* 6, *Congerina* 7, *Limnocardium* 5, *Pisidium* 1. Of these several are new species, most of which are described in this memoir, and some are species not yet determined sufficiently to be named.

This group of fossil mollusks is carefully compared in detail with those of other localities in Eastern Europe and with the fauna of the Caspian and of Lake Baikal; and the Author acknowledges his indebtedness for help and cooperation to his several friends and fellow-workers.

Mollusks from the "Sarmatian Formation" at Markuševec are enumerated at pages 80-82; and an Appendix gives a list (with localities) of the fossil Dreissensidæ of Dalmatia, Croatia, and Slavonia, namely 20 species of *Congerina* and 7 of *Dreissensia*.

An Index of the fossil species contained in Parts I. and III. of S. Brusina's work then follows, pp. 89-96, and of the special recent representatives at pp. 97 and 98.

MISCELLANEOUS.

On a Sporozoon parasitic in the Muscles of the Crayfish.

By MM. F. HENNEGUY and P. THÉLOHAN.

We have recently* reported the existence of a Sporozoon living as a parasite in the muscles of *Crangon vulgaris* and very closely

* Henneguy and Thélohan, "Sur un Sporozoaire parasite des muscles

allied to that which one of us * had already described as occurring in *Palæmon serratus* and *P. rectirostris*.

We have since had occasion to observe in the muscles of the Crayfish a parasite which likewise belongs to the group of the Sporozoa, but which exhibits somewhat remarkable differences from the foregoing forms.

Thanks to the kindness of M. Contejean we have been able to examine fragments of Crayfish muscles from the Department of the Doubs, which in the fresh state exhibited that remarkable opacity to which we have already drawn attention in *Crangon* and *Palæmon*.

In sections of these muscles we have found that the fibres are attacked by a parasite in different stages of development.

At certain points the muscle-fibre is found to be crammed with little ovoid spores having a clear vacuole at their large extremity. The appearance of these spores reminds us of those of the Microsporidia, of *Glugea*, and of the parasites of *Crangon* and *Palæmon*. They are much smaller than the spores in *Crangon* and in size approach those in *Palæmon*.

By the side of these spores younger stages of the parasite are found, represented by nucleated masses of protoplasm. Our observations, though they are as yet very incomplete, have nevertheless enabled us to determine that this organism differs from the parasite of the *Crangon* and of the two species of *Palæmon* in the mode of the development of the spores. These, instead of being formed in a group of eight in each sporogenous vesicle, are produced in variable but always larger numbers. In this character the parasite of the Crayfish approaches the Microsporidia and certain forms of the Myxosporidia.

As regards the group to which this parasite ought to be assigned, since we have not had fresh material at our disposal we have not been able to study the structure of the spores sufficiently thoroughly in order to pronounce an opinion upon the point.

The presence of this sporozoon in the muscles of the Crayfish offers a double feature of interest: it causes our first observations to extend to a larger number of species of Crustacea, and, moreover, it seems that it ought to be of a certain practical importance from the point of view of the etiology of the disease which for several years past has destroyed the Crayfish of our watercourses in the east.—*Comptes rendus des Séances de la Société de Biologie* (Séance du 30 juillet, 1892): from a separate impression communicated by the Authors.

des crustacés décapodes," *Comptes rendus de la Société de Biologie*, June 25, 1892 (Ann. & Mag. Nat. Hist. ser. 6, vol. x. pp. 342-344).

* Henneguy, "Note sur un parasite des muscles du *Palæmon rectirostris*," *Mémoires publiés par la Société philomathique à l'occasion du centenaire de sa fondation* (1888).